

LEXICON DEVELOPMENT FOR BRAZILIAN TEXTILE SENSORY ANALYSIS¹

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Abstract: *This paper aims to present the development process of descriptors that will form the Brazilian textile lexicon for evaluation of textile tactile comfort. Therefore, we used the descriptive and qualitative method and ISO 11035 standards. In the first phase a panel of selected sensory assessors evaluated 20 tissue samples with different textures and compositions, generating 299 terms. In the second phase, these descriptors were analyzed by the panel of evaluators who eliminated the hedonic terms and with same meanings. In the third phase, through similarity analysis the evaluators gathered the 49 final terms in 21 groups. These grouped terms were selected for the lexicon for the sensory analysis of tactile comfort in Brazil. The attributes will be used primarily for the training of assessors experts and later for descriptive evaluation of textile sensory comfort.*

Keywords: *Lexicon. Sensory analysis. Textile comfort*

1. Introduction

To touch the clothing fabric at the time of purchase is one of the most used practices by consumers to evaluate the comfort of the fabric. Thus, the touch is a tool to assess the quality of high sensitivity tissues (Kweon, et al., 2004 and Philippe, et al., 2004). To quantify this action by using concepts and methodologies of sensory analysis can improve the comfort of the product thus meeting the needs of the modern consumer.

The textile comfort evaluation results from descriptive evaluation, which is a complex synthesis of many types of psychological and physiological responses of individuals and of the physical properties of the garment materials (You, et al., 2002).

To describe the parameters for evaluating the comfort of textile products, some researchers are using the sensory evaluation methodology, widely exploited in the fields of food and cosmetics industries (Chollakup, et al., 2004). These methods have been successfully implemented by some researchers such as Philippe, et al. (2004) and Nogueira (2011) who evaluated the fabrics tactile comfort of different textiles

The descriptive sensory analysis is useful when product specifications need to be characterized. To select and define attributes for the products being tested is one of the key steps to a descriptive sensory analysis. A well-developed lexicon can help sensory researchers to perform accurate sensory analysis and compare the results in different locations (Hayakawa, 2009).

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"Lexicons are standardized vocabularies that objectively describe the sensory properties of consumer products. Lexicons developed on scientific principles can be used by several different panels to consistently describe products". (Lawlees&Civille, 2013, p.270)

Philippe et al (2004) made the first investigations in France where they developed lexicon for tactile sensory evaluation of tissues. Nogueira (2011) developed the Portuguese lexicon and later compared it to the French lexicon, adding to his studies visual sensory evaluation. The aim of the two studies was to evaluate textiles attributes to quantify its comfort.

Thus, the objective of this study is to present the development process of descriptors that will form the Brazilian textile lexicon for evaluation of textile tactile comfort. The study was conducted in three stages. First it was generated the descriptors by tactile sensory testing analysis of 20 samples from different tissues; on a second stage, non-relevant terms were eliminated; and on the final stage, the attributes were selected and grouped to form the initial lexicon.

2. Materials and Methods

2.1 Assessor Painel

Lawlees & Civille (2013) state that normally researchers use trained evaluators to develop the lexicons because their experience will allow a better understanding of the attributes thus increasing their ability to describe attributes. Furthermore, the experience of the evaluators can minimize costs and time to researchers. However, in the absence of a panel of experienced evaluators, the authors suggest the formation of a panel of evaluators "from scratch".

For the development of the Brazilian textile lexicon, participated in this study fourteen raters (five men and nine women). They were selected from 43 volunteers aged between 18 and 50. They are students and employees of Federal Technological University of Paraná Apucarana Campus. The selection method used was triangular test sensory analysis, widely used by the food industry (ISO 4120, 2013). Each evaluator conducted more than 100 textile triangular tests over a period of three months.

2.2 Protocol

As a protocol it was adapted from the general guidelines for the selection, training and monitoring of selected testers and sensory expert assessors (AFN EN ISO 8586, 2014). Before each assessment, each volunteer washed their hands with neutral pH liquid soap and was used the same type of disposable towels to dry them. The sensory evaluation room was air conditioned and pleasant. Tactile assessments were performed with visual barrier preventing view of the samples (Philippe et al., 2004 and Nogueira, 2011). In each evaluation session four cabins were used. It had maximum duration of one hour and times were scheduled according to the availability of evaluators of time.

2.3 Samples

Fifty-seven textile samples were collected to generate the descriptors. Most of these samples were from garments making companies of the city of Apucarana region - Brazil. They were of different textures and structures, flat fabrics and meshes composed by natural and synthetic fibers such as linen, cotton, silk, viscose, polyester, polyamide, among others. Of the 57 samples twenty representing the widest range of textures and composition were selected and cut to a size of 20 x 20 cm. (Image 1). Each sample was identified by numbers created randomly with three digits.



Image 1: textile samples for development of the lexicon

3. Lexicon Development

Procedures for the development of the Brazilian textile lexicon for tactile assessment were adapted from ISO 11035 (1994). Evaluators generated descriptors during the first four sessions of one hour. Each participant received 20 samples randomly coded with three-digit numbers and a development form for the corresponding lexicon sample, where they noted the terms that described the sensations when touching each sample.

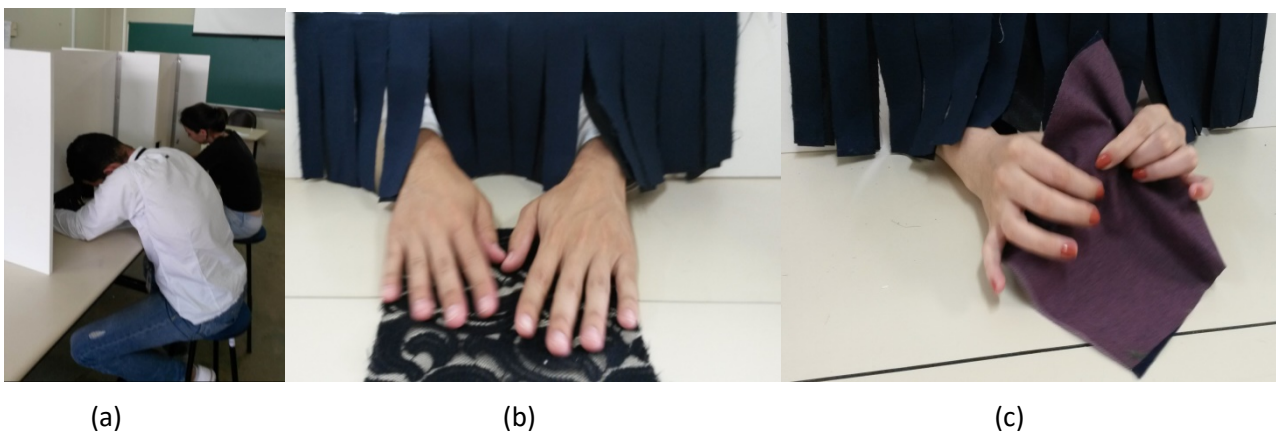


Image 2: (a) sensory evaluation Cabin; (b) Touching the fabric outside and inside (c) Touch with both hands

Evaluators touched the fabric samples arranged behind the cab (visual barrier). They described the feeling as they touched it in three different ways: First the outside of the sample; then the inside; and then raised the sample taking the fabric with both hands (Figure 2). There was no limit of terms for each sample. At this stage an initial list was generated with 299 terms.

The evaluators participated in three discussions of two hours to establish the initial lexicon. During these sessions, the panel evaluators analyzed and jointly eliminated non relevant terms out of the 299 generated, as shown in Table 1.

Table 1: Eliminated Terms

	Eliminated Terms
Antagonistic or hedonic	NICE, UNCOMFORTABLE, NOT COMFORTABLE, DOES NOT BOTHER, QUALITY, COMFORTABLE FABRIC, VERY BAD, GOOD, UNPLEASANT, DELICATE, VERY ROUGH TO SKIN, GOOD TOUCH, GREAT, COZY, WARMTH, HORRIBLE, BOTHERING, ASCO.
Final application of material	POLO COLLAR, LIKE CARPET, SOFA, RUG, WINTER FABRIC, FABRIC FOR DETAILS, UNIFORM, BLANKET, STARCHED, WINTER'S, GRANDMOTHER CUSHION.
Characterize the material or constituent property of this textile material	DAMASKED COTTON, CHIFFON, CREPE, CROCHET, ELASTANE, FELT, FIBER, NATURAL FIBER, LONG FIBERS, GUM, JAKQUARD, SEQUIN, RECALLS VINYL, MESH, POROUS MESH, POROUS MATERIAL, HALF MESH, MUSSELINI, NEOPRENE, ORGANZA, PIQUE, PLASTIC, POLYESTER, LACE, resinous, TWILL, SILK, SYNTHETIC, HAIRY FABRIC, PLANE FABRIC, SYNTHETIC, FABRIC, WOVEN, TNT, CROCHET TOUCH, JEANS TOUCH, SILK TOUCH, WOOF, STRONG WOOF, WIDE WOOF, KNITTING, WARP, VELVET, VINYL, JEANS LIKE, ARTIFICIAL, PEELING, HAIRINESS, WATERPROOF, HAS NO ELASTANE, POROUS, FEELS LIKE PLASTIC, FEELS LIKE WOOL, FEELS LIKE METAL, FEELS LIKE HAIR, FEELS POROUS, RUSTIC , LIKE LITTLE HAIRS, ENTANGLED, LINEN, TWISTED, HAIRS, LOW DIMENSIONAL STABILITY.
Not relevant or not pertinent, as terms that are not touch characterizing	GREAT TOUCH, UGLY, FELLS GOOD, DISTRESS, WEIRD, REFINEMENT, SOPHISTICATED, INTENSE, RESISTANT, RIGOROUS, COMPACT.
Not quantifiable	SNAKE, EXTERNAL, WINTER, MEDIUM, LITTLE BALLS, BAD FINISHING, GROOVES, MICRO RIBS, GOOD FOR FINISHING, LIKE POROS, FIRMA, WITH HOLES, LITTLE HOLES, HOLES, WITH PLAIN PARTS, MANUAL, MEDIAN, DOUBLE TOUCH, DESIGN, DESPAIR , ELEGANCE, CRUDE, LOW QUALITY.
Not understood the same way by the various panel elements. There are attributes mentioned by members of the group that are not interpreted in the same manner by all evaluators	CRACK FABRIC, PAPER LINED, NORMAL, FINGERS SLIDE, WITHOUT FIT, STICKINESS, CAST PARTS, CRUMBLY, DRY WITH SLIGHT WOOF OUTSIDE, WORKED IN TEXTILE TEXTURES, LICKED, AGGRESSIVE, REPETITION, FEELS THE WOOF, RUDE.
Refer to other senses (sight, hearing, memory)	SENSITIVITY, SENSITIVE, FLACKY, BY TOUCHING WITH MOVEMENTO the hairs RISE UP, ALLERGY, ALLIGATOR, DOES NOT KNEAD, DURABILITY, DURABLE, JUST, HONEYCOMB, HONEYCOMB, WET, BALLE, CRUNCHY , DISTRESS TO TOUCH, SHIVER, SHINE, MOLD SMELL, MUST BE SUPER SHINY, "GASTURA" ² , NOSTALGIA, OPAQUE, TRANSPARENCY, SILKY.

Source: Adapted from Nogueira (2011)

After the elimination phase the remaining 171 terms passed through new screening and some descriptors with same meaning were rejected from the list of attributes. Three meeting of one hour were conducted for analysis and combining the remaining 49 singular terms. The resulting terms were assembled in 21 representative groups shown in Table 2.

² uncomfortable sensation caused by acute and continuous sound resulting from friction between an object and a surface

Table 2: Initial Lexicon

RELIEF	PLUSHY	FINE
RUGGED	FRESH	GROSS
ROUGH	HOT	FLOWING
KNEADED	RIGID	FIT
FLAT	ELASTICITY	SMOOTH
HEAVY	SOFT	SLIPPERY
DRY	LIGHT	ITCHES

4. Final considerations

This article presents the Brazilian lexicon development process for tactile evaluation of the textile sensory comfort. Twenty-one terms were defined through a tactile sensory evaluation of a variety of different textile samples for development of a lexicon.

However, this lexicon is not yet validated, as will be analyzed by two methods: first a quantitative evaluation of touch; and a comparative analysis with other textile lexicons developed in other countries until final validation.

After the final validation this lexicon will be used to train the sensory assessors experts in sensory analysis of textile comfort. In a second moment the same lexicon may contribute to sensory evaluation of textile products. This will allow deepening the study on improving the development of garments. It will facilitate the improvement in the development of innovative products, resulting in greater comfort of clothing.

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